Using Palmtop Computers to Retrieve Clinical Information

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We have developed a system for retrieving, storing and accessing clinical data using palmtop computers at Columbia-Presbyterian Medical Center (CPMC). This system involves an HTML-based information caching application to allow hospital physicians convenient, remote access to clinical information during times when use of existing workstations is difficult. By using HTML as the method of data coding, the system may run on different types of palmtop devices.

We used palmtop computers because they offered many benefits when used in a clinical setting. They are easy to carry and can hold large amounts of electronic data. They also have many accessory applications or information resources that could be useful to clinicians. Some institutions have already suggested various uses of palmtop personal digital assistants (PDAs) by clinicians within hospitals [1-3]. Allowing the palmtop computers to access clinical information can increase the functionality of the tools.

While real-time wireless access to clinical information has been used in some hospitals [4,5], and is considered a goal at CPMC, no wireless options were feasible for the system. The cost of wiring the entire hospital was the major issue prohibiting us using wireless technology for the project was the chief thing that prevented. After surveying physicians within the hospital, we determined that a suitable alternative to wireless would be to cache information in the palmtop. This cache could be updated during the day.

Hardware requirements for the system consist of external 14.4K baud modems and HP 200LX palmtop computers. Software requirements are a terminal application (DataCom, included with the computer) and an HTML browser (HV by Andreas Garzotto). We used an available CPMC application which can retrieve and output clinical data in ASCII form to access the data originally. To make this data easily navigable, this ASCII text is automatically parsed and coded in HTML form, with links for different patients and tests. To get to a particular test for a patient involves following at most 3 links. These HTML-coded data are downloaded in compressed form via the modem to the palmtop. The data may then be viewed locally on the palmtop by the physician. Currently the process of downloading one week's worth of data to the palmtop takes about 10 minutes, though most of that time is in the actual transfer of files and doesn't require the physician to be present.

We found many advantages to formatting the data in HTML form. First, HTML is a coding that other types of palmtop computers can use. This makes the system independent of palmtop type. Any palmtop that can send and receive files via modem and can browse HTML files locally can be used with the system; the system will not need to be changed to adapt to palmtops. Faced with constant turnover in palmtop technology, this palmtop-independent characteristic becomes important to the system's long-term use. Second, HTML data coding can allow the data to be accessed from other applications. If wireless applications become a better option in the future, HTML-coded data can still be used.

References

1. Moore RH. Use of a palmtop pocket computer to produce a customised logbook surgical experience. Ann R Coll Surg Engl. 77(2 Suppl):74-6, 1995 Mar.
2. Orta J. Reinarts CL. Comparison of handheld computers for nutrition assessment and support. J Am Diet Assoc. 94(12):1409-14, 1994 Dec.
3. Karshmer J, Karshmer A. Hand-held computing in the patient care setting: A pilot project. Annu Symp Comput Appl Med Care. 7-11, 1995.
4. Shabot MM. LoBue M. Real-time wireless decision support alerts on a Palmtop PDA. Proc Annu Symp Comput Appl Med Care. 174-7, 1995.
5. Ram R. Block B. Development of a portable information system: connecting palmtop computers with medical records systems and clinical reference resources. Proc Annu Symp Comput Appl Med Care. :125-8, 1993.